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EXAMINER

NAHAR, QAMRUN

ART UNIT PAPER NUMBER

2191

DATE MAILED: 10/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/007,766

Applicant(s)

LEWIS ET AL.

Examiner

Qamrun Nahar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is in response to the amendment filed on 6/25/05.
2. The objection to the drawings is withdrawn in view of applicant's amendment and remarks/arguments.
3. The objections to the disclosure are withdrawn in view of applicant's amendment and remarks/arguments.
4. The rejection under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention to claims 6, 14 and 17 is withdrawn in view of applicant's amendment.
5. The rejection under 35 U.S.C. 102(e) as being anticipated by Calder (U.S. 5,963,972) to claims 1-4, 6-15 and 17-25 is moot in view of the new ground(s) of rejection.
6. The rejection under 35 U.S.C. 103(a) as being unpatentable over Calder (U.S. 5,963,972) in view of Cai (U.S. 6,349,363) to claims 5, 16 and 26 is moot in view of the new ground(s) of rejection.
7. Claims 1, 6, 8, 12, 14, 17, 20, 23 and 24 have been amended.
8. Claims 1-26 are pending.
9. Claims 1-26 stand finally provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-56 of copending Application No. 10/005,783 in view of Motoyama (U.S. 5,535,318).
10. Claims 1-4, 6-15 and 17-25 stand finally rejected under 35 U.S.C. 103(a) as being unpatentable over Calder (U.S. 5,963,972) in view of Lomet (U.S. 5,870,763).

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11. Claims 5, 16 and 26 stand finally rejected under 35 U.S.C. 103(a) as being unpatentable over Calder (U.S. 5,963,972) in view of Lomet (U.S. 5,870,763), and further in view of Cai (U.S. 6,349,363).

Response to Amendment

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-26 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-56 of copending Application No. 10/005,783 in view of Motoyama (U.S. 5,535,318). The following example is given in which the actual claim language of Application '783 found in the instant application is underlined, and where the substantial claim language found in the instant application is italicized for clarity.

As per claim 1 of the instant application, '783 discloses (in claim 2):

A computer-implemented method in a data processing system having a computer program for developing a data flow program comprising code segments that operate on data in memory, the method comprising the steps of:

dividing a memory area into blocks and associating each block with at least a portion of the data and with at least one code segment;

storing data read and data write identifiers for each code segment, the data read and data write identifiers identifying at least a portion of the data read or written by the code segment;

determining dependencies between blocks based on the read and write identifiers;

generating a graph representation of the data flow program, the graph representation comprising nodes associated with the blocks, and dependencies between the blocks that provide an execution order for code segments.

'783 further discloses executing a debugging command on the data flow program.

Motoyama teaches executing a debugging command on the data flow program (see Figure 19, column 14, lines 63-64). Therefore, it would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by Application '783 to include executing a debugging command on the data flow program using the teaching of Motoyama. The modification would be obvious because one of ordinary skill in the art would be motivated to monitor program execution flow.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 1-4, 6-15 and 17-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calder (U.S. 5,963,972) in view of Lomet (U.S. 5,870,763).

Per Claim 1 (Amended):

Calder teaches dividing the memory into blocks (column 4, lines 29-40); assigning at least a portion of the data and at least one code segment to each block (column 3, lines 56-62; Table 1 in column 4, lines 8-17; and see Figure 4 for the mapping of the data and code segment to the cache memory); determining whether dependencies exist among the blocks such that a first block depends on data assigned to a second block; and displaying a graph comprising the blocks and the determined dependencies (column 3, lines 56-66; column 7, lines 6-56; column 8, lines 10-54; and column 12, lines 25-37). Calder does not explicitly teach storing data read and data write identifiers for each code segment, the data read and data write identifiers identifying at least a portion of the data read or written by the code segment or determining whether dependencies exist among the blocks such that a first block depends on data assigned to a second block using the read and write identifiers. Lomet teaches storing data read and data write identifiers for each code segment, the data read and data write identifiers identifying at least a portion of the data read or written by the code segment ("state identifier field" in column 18,

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lines 30-31 and lines 55-59); and determining whether dependencies exist among the blocks such that a first block depends on data assigned to a second block using the read and write identifiers (column 19, lines 1-35).

It would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by Calder to include storing data read and data write identifiers for each code segment, the data read and data write identifiers identifying at least a portion of the data read or written by the code segment; and determining whether dependencies exist among the blocks such that a first block depends on data assigned to a second block using the read and write identifiers using the teaching of Lomet. The modification would be obvious because one of ordinary skill in the art would be motivated to minimize cache misses by ensuring the proper order of computer operations (Calder, column 1, lines 17-39).

Per Claim 2:

The rejection of claim 1 is incorporated, and Calder further teaches wherein the step of displaying comprises the step of displaying a graph comprising nodes assigned to the blocks and dependency arcs representing the determined dependencies (column 3, lines 56-66; column 7, lines 6-56; column 8, lines 10-54; and column 12, lines 25-37).

Per Claim 3:

The rejection of claim 2 is incorporated, and Calder further teaches wherein the step of displaying further comprises the step of presenting the dependency arcs using a satisfied

dependency visualization when the determined dependency is satisfied, and presenting the dependency arcs using an unsatisfied dependency visualization when the determined dependency is unsatisfied (column 5, lines 36-41).

Per Claim 4:

The rejection of claim 2 is incorporated, and Calder further teaches further comprising the steps of: receiving a node selection specifying a selected one of the nodes; determining unmet dependencies for the selected node; and displaying in a visually distinctive manner the unmet dependencies in the graph (column 5, lines 36-49).

Per Claim 6 (Amended):

The rejection of claim 2 is incorporated, and Calder further teaches wherein nodes are assigned to the blocks include executed nodes and unexecuted nodes, and wherein the step of displaying further comprises the step of displaying the unexecuted nodes using an unexecuted visualization and the executed nodes using an executed visualization (column 5, lines 36-49).

Per Claim 7:

The rejection of claim 1 is incorporated, and Calder further teaches wherein the data includes a data structure, and wherein the step of displaying further comprises the step of: facilitating visualization of at least a portion of the data structure accessed by at least one of the code segments by graphically presenting at least a portion of the data structure and accentuating

the portion of the data structure accessed by the at least one code segment (column 5, lines 36-49).

Per Claim 8 (Amended):

This is another version of the claimed method discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 9:

The rejection of claim 8 is incorporated, and Calder further teaches wherein the nodes include executed nodes and unexecuted nodes, and wherein the step of displaying comprises the step of displaying the unexecuted nodes with an unexecuted visualization and displaying the executed nodes with an executed visualization (column 5, lines 36-49).

Per Claim 10:

The rejection of claim 9 is incorporated, and Calder further teaches wherein the nodes include executing nodes, and wherein the step of displaying comprises the step of displaying the executing nodes with an executing visualization (column 5, lines 36-49).

Per Claim 11:

The rejection of claim 8 is incorporated, and Calder further teaches wherein the node dependencies include satisfied dependencies and unsatisfied dependencies, and wherein the step

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of displaying comprises the steps of displaying the unsatisfied dependencies using an unsatisfied dependency visualization, and displaying the satisfied dependencies using a satisfied dependency visualization (column 5, lines 36-41).

Per Claims 12 (Amended), 13, 14 (Amended), 15, 17 (Amended) & 18:

These are computer-readable medium versions of the claimed method discussed above (claims 1-4 and 6-7, respectively), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also obvious.

Per Claim 19:

This is another version of the claimed method discussed above (claims 1 and 6), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above, including “initiating execution of the code segments” (Calder, column 5, lines 36-49). Thus, accordingly, this claim is also obvious.

Per Claim 20 (Amended):

This is a data processing system version of the claimed method discussed above (claims 1 and 2), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claims 21-22:

These are data processing system versions of the claimed method discussed above (claims 6 and 3, respectively), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also obvious.

Per Claim 23 (Amended):

This is a data processing system version of the claimed method discussed above (claims 1 and 2), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above, including “means for apportioning a memory into regions and associating the data and the code segments with the regions” (Calder, column 3, lines 56-62; Table 1 in column 4, lines 8-17; and see Figure 4 for the mapping of the data and code segment to the cache memory). Thus, accordingly, this claim is also obvious.

Per Claim 24 (Amended):

This is a computer readable memory device version of the claimed method discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 25:

The rejection of claim 24 is incorporated, and Calder further teaches wherein the data structure further comprises: a processed flag that indicates whether at least one of the nodes is executed or unexecuted (column 5, lines 36-49).

16. Claims 5, 16 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calder (U.S. 5,963,972) in view of Lomet (U.S. 5,870,763), and further in view of Cai (U.S. 6,349,363).

Per Claim 5:

The rejection of claim 2 is incorporated, and further, the combination of Calder and Lomet does not explicitly teach providing for execution of the code segments using threads; receiving a thread selection specifying at least one of the threads; and displaying nodes executed by the at least one thread. Cai teaches providing for execution of the code segments using threads; receiving a thread selection specifying at least one of the threads; and displaying nodes executed by the at least one thread (column 7, lines 30-40).

It would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by the combination of Calder and Lomet to include the step of providing for execution of the code segments using threads; receiving a thread selection specifying at least one of the threads; and displaying nodes executed by the at least one thread using the teaching of Cai. The modification would be obvious because one of ordinary skill in the art would be motivated to provide improved memory performances (Cai, column 1, lines 61-67 to column 2, lines 1-2).

Per Claim 16:

This is a computer-readable medium version of the claimed method discussed above, claim 5, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 26:

This is a computer readable memory device version of the claimed method discussed above, claim 5, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Response to Arguments

17. Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19. Any inquiry concerning this communication from the examiner should be directed to Qamrun Nahar whose telephone number is (571) 272-3730. The examiner can normally be reached on Mondays through Fridays from 9:30 AM to 6:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y Zhen, can be reached on (571) 272-3708. The fax phone number for the organization where this application or processing is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



QN
October 5, 2005



WEI Y. ZHEN
PRIMARY EXAMINER